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GEOGRAPHICAL RECORD

THE AMERICAN GEOGRAPHICAL SOCIETY

New Fellows of the Society; Monthly Meetings of November and December. A regular monthly meeting of the Society was held at the Engineering Societies' Building, 29 West Thirty-ninth Street, on Tuesday evening, November 23, 1915. Vice-President Greenough, Chairman of the Council, presented by name the following thirty-six persons, recommended by the Council for election as Fellows, and after a vote they were declared elected.

Samuel Abbott
Walter Adams
Gardner W. Allen
Gilbert Allis
C. L. G. Anderson
Mrs. Richard G. Babbage
Jorge A. Boerol
William D. Boyce
G. J. Bruce
Philip T. Coolidge
Joseph S. Diller
George M. Douglas
Elizabeth F. Fisher
N. Dwight Harris
E. Lester Jones
Nand Lal
Henry Goddard Leach
Frank Leverett
John J. Lordan
Seth Low, II
Deodoro Moegle
Frederick K. Morris
Joseph Edward Otis, Jr.
Sidney Paige
Harold S. Palmer
Paul S. Phenix
G. C. Piché
Elizabeth K. Reynolds
Heinrich Ries
Waterman S. C. Russell
Hidezô Simotomai
Harold Vincent Smith
Millicent Todd
Stephen Sargent Visher
Wallace O. Westfeldt
Lucy L. W. Wilson

Mr. Henry R. Rose, D.D., then addressed the Society on "The Countries at War."

At the regular monthly meeting on Tuesday evening, December 21, 1915, the following thirty-four persons, recommended by the Council, were presented by name by Vice-President Greenough for election as Fellows, and after a vote they were declared elected.

William Billings Aspinwall
Kimball C. Atwood, Jr.
Elliot C. Bacon
Paul V. Bacon
Arthur D. Baldwin
David F. Barrow
Florence Bascom
Theodore S. Beecher
Silas P. Beebe
A. C. Boyle, Jr.
Amos F. Breed
Templeton Briggs
Walter B. Briggs
William Gray Brooks
Charles S. Brown, Jr.
Frederic King Butters
Charles H. Calusdian
Henry Harmon Chamberlin
R. Percy Chittenden
Cornelius E. Donnellon
Laura Hatch
Florrie Holzwasser
Elbridge C. Jacobs
W. C. Mendenhall
Bertha Merrill
Gustavus Myers
P. E. Pieris
Hamilton Rice
Deette Rolfe
Carl O. Sauer
Joseph F. Simmons
Hilda Stam
May G. Taylor
Russell A. Wood

Prof. Will S. Monroe, F.A.G.S., then addressed the Society on "The Balkan Peninsula."

NORTH AMERICA

Physiographic Excursion to the Western United States. The Columbia University Physiographic Excursion to the West, led by Prof. Douglas W. Johnson, was one of the important geographical events of the past year. There were thirty-three members of the party, including Prof. Florence Bascom, Bryn Mawr; Prof. A. C. Boyle, University of Wyoming; Prof. E. C. Jacobs, University of Vermont; Prof. I. H. Ogilvie, Barnard College; Prof. C. W. Brown, Brown University; Miss Dora Keen of Philadelphia; a number of school teachers of New York, Trenton, and other cities, and students of Columbia University.

The party left New York on July 4. Yellowstone Park was entered via Billings and Cody. Cody stands on a terrace of gravels above the Shoshone River, a true plains town. The mountain range just west of Cody, forming an outlier of the Absaroka Range, is structurally an anticline with a north-south axis. Its limbs are flanked by a splendid series of hogbacks, those on the east being partially buried in the more recent gravel deposits. West of the anticline a north-south valley, carved on some of the less resistant sedimentaries, is used as a pounding reservoir for the artificial Shoshone Lake. The great Shoshone Dam is built on the west flank of the anticline, where the river, cutting across the range, passes from the valley opened out on the sedimentaries into the steep-walled gorge cut through the crystalline axis. The main portion of the Absaroka Range, forming the eastern barrier of the Yellowstone basin, is a maturely dissected and glaciated plateau whose horizontal beds consist of lava flows and volcanic agglomerates. From anywhere within the Park it appears rugged and serrate on the skyline. The wonderful all-day ride through the Shoshone Canyon and over the Absaroka Range, terminating in the rapid descent into the Yellowstone, made a profound impression upon everyone.

Five days were spent in Yellowstone Park with stops at Yellowstone Lake, the different geyser basins, the Grand Canyon, and Mammoth Hot Springs. A half day's trip to the top of Mount Washburn gave an excellent opportunity to study the broken character of the Yellowstone Park plateau, with its encircling mountains and deeply entrenched canyons. Mount Washburn and its associated peaks apparently do not represent the remnant of one of the old volcanoes which supplied the lava-filling for the Yellowstone basin, as has been suggested; but rather the mountain is a sharply tilted and much-dissected block of an older series of lavas, possibly equivalent in date to those of the Absarokas.

The ride from Gardiner down the Yellowstone valley gave the party an opportunity to see the terraces of the Yellowstone River cut in fluvio-glacial gravels, a rather recent lava flow capping the gravels and extending across the valley, except where cut through by the river. A day's ride across the plains brought the party to Glacier National Park.

The first day's outing was by automobile along the east front of the Rockies, giving opportunity to study the famous Lewis thrust fault, the glacial troughs of the Two Medicine Lakes, St. Mary Lake, Lower St. Mary Lake, and Swiftcurrent Creek, as well as glacial moraines on the neighboring plains. Two days were spent at Many Glacier Camp, from which a tramp of fourteen miles was made to Iceberg Lake, a typical glacial tarn occupying a symmetrical cirque whose sheer walls rise over 3,000 feet above the lake surface. The next day a horseback ride of twenty-three miles over Piegan Pass brought the party to Upper St. Mary Lake. Two days here, a boat ride down the lake, a tramp to Gunsight Camp with a night there, a hard climb over Gunsight Pass to Sperry, another night within a mile of Sperry Glacier, and finally a tramp down to Lake McDonald and the railroad, supplied a wonderful panorama.

Grand Coulee, Washington, an old abandoned channel or canyon of the Columbia River, showed features reminiscent of a former occupancy by water: "fossil" waterfalls larger than Niagara with plunge pools at the base even now filled with water; old river bottoms; and islands rising above the former river bed. Then came a study of Lake Chelan on the east slope of the Cascades, a region made classic ground for the geographer by Henry Gannett's paper, in which, for the first time, the essential relation between glacial troughs and hanging valleys was made clear. The party was much impressed by the fact that so valuable a paper should have been based on a locality where the trough and hanging valleys were so imperfectly developed.

At Medford, Oregon, a trip to Table Mountain was arranged by the Medford Commercial Club. From Medford the party enjoyed an all-day automobile ride through the Cascade forests to Crater Lake. Two days were given to a study of features along the rim and a trip to the cinder cone of Wizard Island within the depression. On the third day the party descended the eastern side of the Cascades into the Great Basin, where remarkable examples of very young fault-block mountains were observed en route to Klamath Falls.

A few days at San Francisco gave an opportunity to see the Exposition and to accompany members of the Geological Society of America on an excursion to the San Andreas rift, movement along which caused the California earthquake of 1906. A week was spent in the Yosemite Valley and the Big Trees region, with special attention to the theories as to the origin of the Yosemite. It was generally agreed that none of them accounts for all the observed phenomena so well as that of profound glacial overdeepening of a preexisting river valley.

Mr. J. S. Diller of the U. S. Geological Survey joined the party on the trip to the summit of Lassen Peak and discussed the effects of the late extrusion of viscous lava and the great mud flow which for many miles inundated a valley on the eastern side of the mountain. Another day was spent at Cinder Cone, the symmetrical little volcano which has recently been active and whose lava flow dammed up a neighboring valley to form a lake of more than ordinary interest.

In the Salt Lake region Professors E. S. Hinckley and F. Buss made it possible for the party to study the mines at Bingham Canyon, the old terraces of Lake Bonneville, the Wasatch Mountains, and the recent faulting in the alluvium and moraines. Mayor Fell of Ogden provided autos for a trip along the base of the mountains and through Ogden Canyon. The Ogden water supply was of especial interest. Artesian wells east of the Wasatch liberate the water content of loose gravels which dip down from the adjacent mountain slopes beneath the compact lake beds of an old estuary of Lake Bonneville, the water then being piped through the canyon to the west side of the range for use in the city. At Provo a visit was made, under the guidance of Professor Buss, to the Provo delta and the series of small *grabens* formed by recent faulting in the alluvium along the mountain base. A few weeks before the arrival of the party an earthquake, presumably due to displacement along this line, caused some alarm.

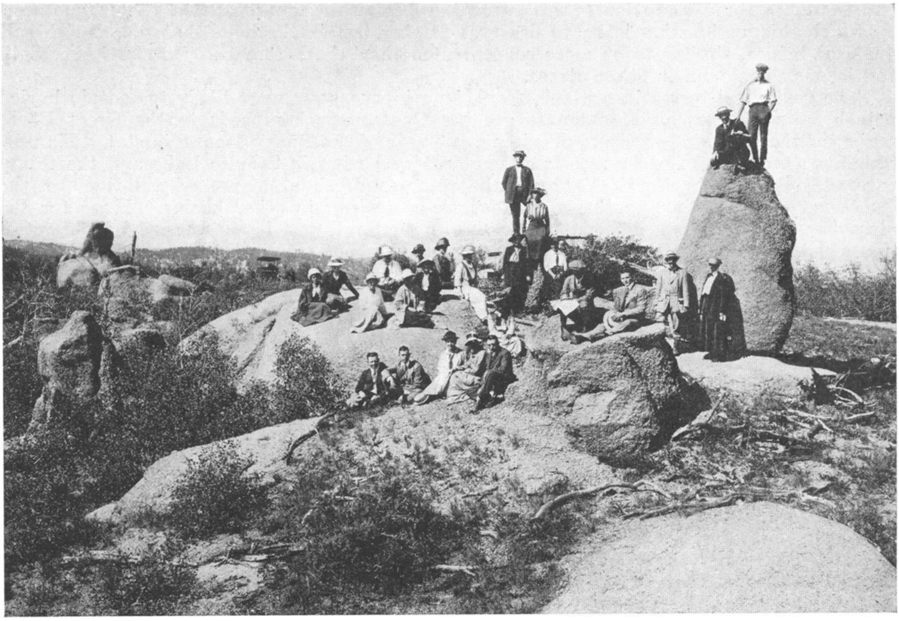

FIG. 1—Weathered granite on the surface of the Rocky Mountain peneplain west of Palmer Lake, Colorado; and members of the physiographic excursion.

In Colorado, there was a twelve-mile tramp through the Royal Gorge, an auto trip over the Sky Line Drive and to the upper rim of the gorge west of Canyon City, another trip from Canyon City along the base of the Front Range to Colorado Springs, the ascent of Pike's Peak, and a drive through the Garden of the Gods. A profitable day's trip from Golden to Morrison Park, led by Professor Victor Ziegler of the Colorado School of Mines, marked the last day of the two months spent in studying the origin of land forms. At Denver the party separated, some going east, and the others continuing their studies in the Grand Canyon, the Petrified Forest, and the Painted Desert of Arizona.

Annual Report of the U. S. Geological Survey. From the point of view of national defense as well as general education the topographic mapping of the United States is proceeding at an alarmingly slow rate. The appropriations for this work should be doubled at least. Maps covering 40,000 square miles are less showy than a battleship but they may be of much greater importance in time of war. The Thirty-Sixth Annual Report of the Director of the U. S. Geological Survey, for the fiscal year ended June 30, 1915, shows that the topographic survey of the United States now covers but 40.2 per cent of the country's vast area. The total area mapped to June 30, 1915, was 1,218,290 square miles; and the area mapped in the past fiscal year was 20,508 square miles. The topographic maps have been completed for Connecticut, the District of Columbia, Maryland, Massachusetts, New Jersey, Rhode Island, and Washington. Only 11 per cent of the area of New York and 3 per cent of Ohio remain to be mapped.

Some of the more important features of the report are outlined in the following paragraphs.

The Search for Potash. In the search for potash no clue has been neglected. A deep well was drilled in 1914 near the center of the Black Rock Desert, in western Humboldt County, Nevada, and, on November 16, was completed to a depth of 1,500 feet. No bed of potash or other salts, in massive form, was encountered in this well, but the test is not considered conclusive as to the hypothesis that buried saline deposits remain in some of these basins as the result of the drying up of the lakes of Nevada, eastern California, and southern Oregon in Quaternary time. The field to be explored is large, and both funds and facilities for exploration have limited the trials to a few localities. The hypothesis on which this exploration is based deserves further test in the hope that potash-rich salt muds or brines, similar to or more concentrated than those found at Searles Lake, California, may be found in other places.

The geological formations which, from the evidence, seem most likely to contain buried potash salts in commercial amounts are the Quaternary lake beds in the Great Basin region of the West and the Permo-Triassic red beds of the Rocky Mountain states, Kansas, Oklahoma, and Texas. The results of exploratory boring in Searles Lake and the thinly covered salt beds in Death Valley, California, establish a degree of validity for the Quaternary lake basin hypothesis and encourage testing in other basins. Hope for the discovery of potash deposits in the red beds of the Southwest is encouraged by the detection of slight potash indications in the west-central region and in the Panhandle of Texas. It is hoped that drillers for oil and water, in the red-bed region and also in the salt-bearing regions of the Salina and other formations in the eastern states, may take advantage of the co-operation of the Geological Survey in the examination of their drill records and cuttings, so that the possible presence of potash deposits of value in any of these regions may be recognized.

Coal and Oil Fields. The coal resources of the many fields are to be differentiated and, with additional and more precise data than have hitherto been available, will be recalculated quantitatively. Looking forward to the time when the oil and gas resources of the United States will have become depleted, the Geological Survey is giving some attention to the carbonaceous shales of the United States and their capacity to yield petroleum, gas, and other valuable distillates.

Various chapters describe the coal fields of Missouri, the Judith River coal field in Chouteau and Fergus counties, Montana, embracing 600 square miles, the subbituminous coal and the lignite regions of eastern Montana, the geology and coal resources of northern Teton County and the Pine Hills region, Montana.

Study of Placer Deposits. The most important of the new co-operative projects undertaken by the Survey and the Bureau of Mines is that for the study of the placer deposits of the United States. Preliminary work, initiated by the Geological Survey, will determine the character, geological occurrence, and origin of the deposits. The Bureau of Mines will study methods and costs of placer mining. It is expected that the field work will extend over two or more field seasons.

The Canal Zone and Antillean Region. The investigations to determine the geological formations, their correlation, and the geological history of the Canal Zone and adjacent regions of Panama and Costa Rica have continued, and most of the reports are approaching completion. The series of reports, which will contain important conclusions as to geological correlation and geological history, will be published by the Smithsonian Institution. Reports similar to those on the Canal Zone are in preparation for the Lesser Antilles.

Alaska. Ten parties were engaged in surveys and investigations in Alaska. About 1,000 square miles were covered by exploratory geological surveys (scale, 1:500,000); 7,700 square miles by reconnaissance geological surveys (1:250,000); and 325 square miles by detailed geological surveys (1:62,500).

Land Classification Board. The work of this board is to receive such results of field investigations as are adaptable to public land classification and to turn these results into actual classifications which become the basis, in the Department of the Interior, of such administration of the public land laws as depend on the character of the lands. Here is a summary of the more important results of the Land Classification Board in the past fiscal year:

In the states under the jurisdiction of the board no coal lands were withdrawn from entry, but 2,363,646 acres were restored to entry, leaving the withdrawn area 48,244,274 acres. At the end of the year 19,489,771 acres had been valued at an average price of $40.60 an acre. About half of the restored land was in Montana and a third in Oregon and Utah; 197,073 acres of oil land were withdrawn from entry and 180,818 acres of non-oil land eliminated from withdrawals, leaving the net area included in oil withdrawals 4,774,418 acres. The phosphate classifications resulted in a withdrawal of 273,221 acres and a restoration of 454,894 acres, leaving the net area of withdrawals 2,660,376 acres. On the basis of containing metalliferous minerals 970,210 acres, chiefly in Indian reservations, were classified, 929,916 acres as non-mineral and 37,294 acres as mineral land; 17,485,259 acres were classified as non-irrigable, the total area thus designated amounting to 235,596,180 acres.

The total area withdrawn on June 30, 1915, was 58,494,844 acres. Of this total all the lands included in coal, oil, phosphate, and potash reserves, aggregating 56,021,081 acres, may now be entered under the non-mineral land laws, the remaining withdrawals of miscellaneous types, aggregating 2,473,763 acres, being not yet subject to agricultural entry. This has greatly reduced the interference of the withdrawal policy with agricultural development.

The American Merchant Marine. The Port of Boston has published a bulletin entitled "The Use and Benefits to Massachusetts Manufacturers and Wage Earners of an American Merchant Marine." The terse statement contains some striking figures. Federal efforts to promote a merchant marine helped to raise the tonnage of American vessels engaged in foreign trade from 984,608 in 1810 to 2,535,206 in 1855. Decline commenced with the dissensions of the Civil War and has continued until at present (1914) the tonnage amounts only to 1,076,152. Figures of the carrying trade between the United States and Germany are significant. In 1914, whilst ninety per cent of German exports to the United States were carried in German ships, only one-fifth of one per cent of United States exports to Germany were carried in American ships.

Twelve Hundred Miles of Navigation on the Kuskokwim River, Alaska. The field work connected with the charting of the approach and entrance to the Kuskokwim River (*Bull. Amer. Geogr. Soc.*, Vol. 47, 1915, pp. 205 and 954) was completed in 1915 by the steamer *Yukon.* A press bulletin of the Coast and Geodetic Survey says that a reconnaissance survey was made inland from Bethel, the head of deep-sea navigation, for 550 miles to McGrath, the main settlement on the upper river, from where, on a clear day, Mount McKinley can be seen 150 miles eastward. A river steamer may ascend beyond McGrath for 200 miles. The river, with its tributaries, offers 1,200 miles of navigable waters. The *Quickstep,* the only steamer on the river, draws four and one-half feet and can push a 300-ton barge up stream. She averages two trips from Bethel to McGrath during the open season, from May 15 to October 15. She figured, last summer, in the first good determination of positions along the river's course. Some previous positions were found to be fifty miles in error, and a new map of the river is urgently needed. For the lower 100 miles the Kuskokwim winds through the low lake country; for the next 200 miles it cuts through mountains where the rapids have a six to eight mile current and the banks, in places, rise over 1,000 feet directly from the water. The upper river flows through an immense basin, over which are scattered solitary peaks with a ring of distant mountains on the horizon. The prospector and homesteader have already visited the valley and will perhaps repeat there the story of the Yukon and the Tanana. Three creeks, Candle, Bear, and Cañon, give promise of profitable hydraulic development, rich cinnabar claims having been staked upon the river banks. Vast areas for reindeer are available, and the Irish potato grown there is not surpassed anywhere.

Canadian Fisheries, 1914-15. The decline in value of the Canadian fisheries for the year 1914-15 is mainly accounted for by the returns from British Columbia (*48th Ann. Rept. Fisheries Branch, Dept. of the Naval Service,* Ottawa, 1915). The year is a lean one in the four-year cycle salmon run on the Fraser. Nova Scotia lobster and mackerel fisheries were affected unfavorably by the war, but other provinces showed an increase: Albertan fisheries, in fact, were indirectly encouraged by the same cause. Decline of the European fur markets induced many trappers to transfer their energies to fishing as a source of livelihood. Apart from this circumstance the northern part of Alberta is making progress in the industry and will do so on a greater scale with the improvement of transportation facilities.

Irrigation in Alberta. The Canadian government presents the results of a recent investigation into the suitability of the Calgary region for irrigated farming (Report on the Climatic and Soil Conditions in the Canadian Pacific Railway Company's Irrigation Project, Western Section, *Irrigation Series Bull. No. 3,* Dept. of the Interior, Ottawa, 1915). After a comparison of climatic and soil conditions with those of similar regions where irrigation has been successfully conducted, the report claims that irrigation is certainly desirable and probably necessary for satisfactory agriculture at Calgary. In the length of the growing season the region compares favorably with the San Luis Valley, Colorado (7,500 feet altitude), where mixed farming, based on irrigation, has been practiced for over forty years. Local frosts appear to be less severe, and in the mean temperature of the growing period, Gleichen, which may be taken as representative of the Calgary region, is only 1° lower than San Luis. The average time for the maturing of irrigated wheat is stated to be 126 days, a few days longer than for the unirrigated crop. With the first killing frost on September 4, crops are quite safe during ordinary years. Moreover the heat-conserving properties of moisture enable the irrigated grain to more easily withstand early frosts. A further advantage gained by irrigation is the increase in yield—56 per cent for wheat. Whilst the average rainfall of the last decade or so has been sufficient in total amount (Gleichen averages 14.3 inches for the last twelve years), it must be borne in mind that the distribution during the growing season is the vital factor and that the climate has the characteristics of semi-aridity—variable periods of drought and unutilizable rains. Calgary records, which go back further than those of Gleichen, show an average of only 7.4 inches for the years 1885-1896, a deficiency making irrigation absolutely necessary. The soil of the section is said to be rich and, where proper drainage is instituted, does not become excessively alkaline under irrigation.

Origin of the Name Manitoba. A recent number of the *Bulletin de la Société de Géographie de Québec* (Vol. 9, 1915, No. 5, pp. 310-311) throws light on the derivation of this name. Although various explanations have been put forward from time to time, the consensus of opinion points to the Assiniboin words *mine* and *toba,* meaning respectively "water" and "prairie." Accordingly "Minetoba" signifies "prairie waters" or "prairie lake." The name of "Lac des Prairies" used by La Vérendrye to designate Lake Manitoba in his writings is a correct rendering of the native form. Nevertheless, Minetoba, or rather its common variant Manitoba, has come to stay. It is gratifying to find that the French version eventually gave way to the native American and that the first Dominion province created west of the Great Lakes bears a name of local origin.

Soils of the Rainy River District of Ontario. The Rainy River district occupies some 1,000 square miles between Lake of the Woods and Rainy Lake. While still largely dependent on forestal resources, soil and climate favor its future agricultural development. At present no more than a third of the land is occupied and under five per cent is improved, but this improved area supports a rural population of ninety to the square mile and has produced excellent crops of wheat (W. A. Johnston: Rainy River District, Ontario: Surficial Geology and Soils, *Canada Geol. Surv. Mem. 82: Geol. Series No. 68,* Ottawa, 1915). Physiographically the region is to be considered as the extreme eastern edge of the Prairie Plains. Relief is slight and the major part of the surface is covered with a deep mantle of glacial material: a lower deposit of till from the invasion of the Labradorian ice and a later one from the Keewatin center, glacio-lacustrine material from an early lake stage, and later and more extensive lacustrine and littoral formations of ancient Lake Agassiz. Though lakes are not common, on account of the uniformly aggraded character of the drift, the area is still in the earliest hydrographic stage and is ill-drained and swampy. Of the 755 square miles surveyed nearly one-third is covered with accumulations of muck and peat averaging three feet in thickness. Such surfaces are usually well forested with a characteristic association of cedar, tamarack, and spruce. Twenty-seven per cent is occupied by lacustrine and glacio-lacustrine soils of clay-loam that support poplar and balm of Gilead, with elm and oak on the better-drained portions. A fine sandy loam weathered from the calcareous till comprises about twenty-four per cent and forms the best agricultural land. Deciduous trees make a greater showing in this section, still extensively timbered in spite of the numerous fires that have destroyed much of the original growth.

Earthquake in the Imperial Valley, California. One of the severest earthquake shocks since the San Francisco earthquake of 1906 occurred on June 22 in the Imperial Valley, southeast California. At 7:40 P. M. a heavy shock cracked and destroyed buildings and was followed an hour later by another severe shock. Subsequent shocks were frequent but diminished in intensity, though severe recurrences were reported up to August 19, as appears in the report of Carl H. Beal (The Earthquake in the Imperial

Valley, Cal., June 22, 1915, *Bull. Seismolog. Soc. of Amer.*, Vol. 5, 1915, pp. 130-149). The shock was perceptible over an area of 50,000 square miles.

The Imperial Valley is in the Colorado Desert, and a small part of it extends into the northern part of Lower California, Mexico. Most of the area affected is sparsely settled excepting approximately 250 square miles in the heart of the Imperial Valley. In the surrounding portions of the desert and in the mountains on the west and southwest there are practically no settlers. The Imperial Valley is almost entirely below sea-level in a depression which was filled in recent geological time by a body of water. Irrigated from the Colorado River, this valley has been turned within the past few years into one of the most fruitful areas of truck farming in California.

One fault and probably several others are believed to pass through the valley, but very little geological evidence is available, and most of the conclusions as to the faults are based upon the existence of hot or mud springs on the valley floor and on the character of the topography of the foothills and through the mountains along the west side of the desert.

One of the maps accompanying Mr. Beal's paper gives the location of the more important faults that are shown by field study or are believed from other evidence to exist. From all the facts obtained Mr. Beal says that the disturbance probably originated on the San Jacinto fault, which is believed to be prolonged in the bed rock underneath the Imperial Valley. This fault has been traced from the San Gabriel Mountains to the northwest towards El Centro and nearly to the edge of the desert. It has been shown that it probably exists in the Superstition Mountains, 15 miles northwest of El Centro, and it probably passes through the mud volcanoes on the west side of Volcano Lake, with the settlements of the Imperial Valley to the east and west of it. Mr. Beal says the disturbance was equal in violence to that of the San Francisco earthquake.

SOUTH AMERICA

The Mapping of Brazil. About one per cent of the total area of Brazil has been mapped to date on the scale of 1:100,000, mainly in the state of São Paulo, where 23 quarter-degree sheets have been issued, according to a recent report of the Brazilian Ministry of Roads and Public Works (A. P. da Cunha: Determinação de coordenadas geographicas no Estado do Ceará, *Inspect. de Obras contra as Seccas Publ. No. 27,* Rio de Janeiro, 1914, pp. iv-x). Surveying for maps on the same scale was also undertaken in the states of Minas Geraes and Rio de Janeiro. This work, however, has been temporarily abandoned.

An agreement was reached in 1909 between the Serviço Geologico e Mineralogico do Brasil and the Inspectoria de Obras contra as Seccas whereby surveys of the semi-arid regions of the country were to be made jointly by the two departments. The states affected by this decision are Ceará, Rio Grande do Norte, and Parahyba. The scale of 1:1,000,000 was adopted for this work, and it was decided to issue the maps in conformity with the symbolism determined for the "Carte Internationale du Monde." Altogether 51 sheets will be required on the millionth scale for the surface of Brazil. Some of the geological maps on this scale issued as a result of this agreement accompany publications which are listed under "Brazil" in the section on "Geographical Publications" in this number.

Dr. Farabee's Work in the Amazon Basin. A letter received by Mr. G. B. Gordon, director of the University Museum, Philadelphia, from Dr. W. C. Farabee, dated October 8, 1915, tells of his journey between the Tapajoz and the Xingú Rivers, where he discovered a large plain of waste desert country and in it found the central villages of the Mundurucu Indians. In this journey, which occupied about four months, astronomical observations were made for latitude and longitude, and several rivers tributary to the Tapajoz and branches of these rivers were mapped for the first time. The chief object of the expedition was, of course, anthropological. Dr. Farabee lived for a considerable time among the Mundurucus, studying their language, their manners and customs, making a vocabulary and writing down much of their folk-lore, as a result of which he expects to settle the long-vexed question of the relation of this tribe to the Tupi. He also visited villages of the Apiacas and Manes and obtained important data.

Further Information on the Rio Ananás Expedition. Lieut. William H. Mardock, U.S.N., under date of December 10, 1915, wrote from Santarem on the lower Amazon to Colonel Theodore Roosevelt supplying further data on the exploration by Lieutenant Marquez de Souza of the Rio Cardosa, a tributary of the Rio Theodoro.

The January *Review* (p. 50) contained a letter from Colonel Roosevelt giving the first report on De Souza's explorations. Lieutenant Mardock's letter contains a translation of the report of the survivors as published in a Manáos newspaper. The field work was conducted by the Commissão de Linhas Telegraphicas Estrategicas de Matto Grosso ao Amazonas, the organization of which Colonel Rondon is the chief. Lieutenant De Souza and Senhor Carvalho, the master constructor of the telegraph line, were killed by Indians on May 29, and one other member of the party was badly wounded. The rest escaped and, reaching the Rio Aripuana, descended by the launch *Hercules* to the Amazon. It is supposed that the Indians formed part of the Araras tribe.

Colonel Roosevelt has kindly transmitted this information for the use of the Society. It has also been learned that there has recently been an uprising among the Nhambiquaras and that several settlements through which the Roosevelt-Rondon expedition passed were wiped out.

Lieutenant Mardock reports further that at a conference in Rio de Janeiro on December 5, 1915, it was proposed to give the name Rondonia to the region between the Juruena and Madeira Rivers in honor of Colonel Rondon.

Botanical Expedition to the Desert Regions of Brazil and Argentina. Dr. J. N. Rose returned in October from his second South American exploration trip, where he was sent by the Carnegie Institution of Washington. The chief object of his trip was to study and collect cacti from the great desert regions. From Bahia, Brazil, he visited by rail the semi-arid region of the northern part of the state of Bahia. This dry part of Brazil is in the *caatinga,* or thornbush, region. The desert flora is extremely interesting, possessing many features in common with the West Indies. The cactus flora consists of a number of very curious types, several of which are new. Excursions were also made over the other two railroads connecting with Bahia, one south which goes as far as Toca da Onça and the other to the southwest which terminates at Machado Portella. From Rio de Janeiro as the next base excursions were made to the top of Itatiaya, the highest mountain peak in Brazil; to the Organ Mountains by way of Petropolis; to the great salt works of Brazil, by way of Cabo Frio; to Isla Grande, a remarkable island lying south of Rio de Janeiro; and also to São Paulo. In this last-named region there has been a remarkable development of epiphytic cacti, of which there are some forty species. Later on, excursions were made in Argentina from Buenos Aires to Mendoza and to Córdoba. From all these places large collections of living and herbarium specimens as well as numerous photographs were obtained.

EUROPE

Kabyle Labor in French Grain Fields. Beneficent colonial policy in North Africa is now bringing France a just reward. Everyone knows of the military achievements of the native Algerians and Tunisians, but few people are aware of their contribution to French agriculture. Scarcity of harvesters in the wheat fields of the Beauce induced the government to import some thousand laborers from the mountain farms of the Kabyle country ("France's Colored Troops," by Stoddard Dewey, *The Nation,* Dec. 16, 1915). Thrifty, industrious, adaptable, the Kabyles have proved their value as a dependable source of labor. Besides the mutual material gain—their work was well worth the dollar a day that to them represented unwonted wealth—the educational and social gain should prove a distinct asset in French colonial progress.

ASIA

Japanese Internal Colonization. The stream of government-supported immigration to the island of Hokkaido in 1914 suffered a set-back attributable to the famine of the previous year. The immigration movement has been largely responsible for the notable increase in population within the last years. In 1908 the population was only some 30 to the square mile (see "Japanese Colonial Methods," by Ellen Churchill Semple, *Bull. Amer. Geogr. Soc.,* Vol. 45, 1913, pp. 255-275); in 1912 it had risen to about 55 to the square mile (Trade of the Consular District of Hakodate, *Dipl. and Cons. Reports,* Annual Series, No. 5478, Nov., 1915). Economically Hokkaido appears to be approaching a position of stability: revenues are sufficient for self-support, though for any extensive scheme of development the island will still be dependent on the central government.

Northern Routes of Commerce Between Europe and Asia. The prolongation of the European war tends to create commercial sea routes between northern European ports and the Arctic harbors of Siberia. *Commerce Reports,* published by the U. S. Department of Commerce (No. 291, Dec. 13, 1915, p. 1021), record an instance of a recent successful cruise by the steamers *Haugastoel* and *Eden,* respectively of 3,100 and 2,000 tons. Both ships belong to the Siberian Steamship Manufacturing and Trading Co., Ltd., and were fitted out at Tromsö with mixed cargoes for the Ob and Yenisei Rivers. On the return trip they carried Siberian products, such as butter, hemp, flax, etc., to Grimsby, England. It took nineteen days for the *Haugastoel* to reach Tromsö. The *Eden* made the trip in five more days. Plans have been laid for sending a large fleet during the mild-weather months of 1916, and it is expected that surplus stocks of grain, hides, flax, and linseed from central Siberian districts will be available for European consumption through these routes.

Difficulties of transportation account largely for the backward condition of Siberia. The absence of railroads or the high cost of operation in the few districts they traverse diverts traffic toward the rivers. But the fact that they flow northward into a region of extremely rigorous winters robs them of much of their value as trade channels. The most serious drawbacks to river navigation exist at the outlets rather than upstream. Shifting sandbars and ice-floes are the dangers which lie respectively in the path of river steamers or of ocean craft. When these obstacles are overcome, there will probably be an increase in the exchange of European manufactured goods for the central Siberian products of grain, hides, and lumber. Nansen's ''Through Siberia, the Land of the Future'' contains excellent descriptions of the various regions of Siberia and their products.

AUSTRALASIA AND OCEANIA

Annexation of the Gilbert and Ellice Islands. The *London Gazette* of November 12 announced the annexation of the islands of the Gilbert and Ellice groups in the Pacific Ocean. In 1892, they had been proclaimed as a protectorate of Great Britain. The native governments having recently expressed their desire that the islands be annexed, they will henceforth form part of His Majesty's dominions and will be known as the Gilbert and Ellice Islands Colony. The Gilbert group lies between 170° and 180° E. and is bisected by the equator; the Ellice Group lies between 5° and 11° S. and in about 178° E. The population of the islands composing the colony was estimated (1911) at 26,417 natives and 446 foreigners. The largest island of the Ellice group is Funafuti, where, some eighteen years ago, a boring was carried down to a depth of 11,014 feet, proving the existence of a mass of pure limestone to that depth without trace of any other rock. This result was regarded as favorable to Darwin's theory of the origin of coral reefs.

POLAR REGIONS

The Coal Mines of Spitzbergen. The existence of coal in Spitzbergen has been known for a long time, but it may not be so well known that the coal mining development there is chiefly the work of a Boston company which seven or eight years ago acquired title to the coal mines in Advent Bay, Ice Fiord, on the west side of Spitzbergen, and, in conjunction with a Norwegian company, to the coal region of Green Harbor. The coal is of excellent quality, is sent to Norway and also to Archangel, Russia, which is a growing market for this coal. The miners in Advent Bay, at first thirty or forty, now number 350, mostly Norwegians. They have been encouraged to bring their families with them, are lodged in comfortable houses, and are supplied with everything they need at reasonable prices. The Advent Bay mine is on the flank of a mountain about 1,200 feet above sea-level and produces about one thousand tons of coal a day. Owing to the ice conditions, the coal can be shipped to Europe as a rule only between July 1 and September 2.

Fate of the Crocker Land Expedition. The *George B. Cluett,* the ship sent to bring home the members of the Crocker Land Expedition *(Bull. Amer. Geogr. Soc.,* Vol. 47, 1915, pp. 452 and 535) has had the misfortune of being held fast in the ice, unable to reach her goal or to return. The ship, which left New York on June 9 with Captain George Comer in command and Dr. E. O. Hovey on board, was expected to be back in September or October. Instead she was still 125 miles from Etah, the expedition's headquarters, on September 12, on which date she arrived at North Star Bay in Wostenholme Sound on the west coast of Greenland in 76½° N., after being delayed for thirty-five days in Melville Bay by ice and trouble with the motor. Because of the autumn ice, she did not dare proceed to Etah. A motor boat of the Danish mission was, however, to call for the members of the expedition and bring them to North Star Bay. In the meantime, however, the *George B. Cluett* has undoubtedly been forced to spend the winter there. No anxiety need be felt, however, for the safety of either the main expedition or the relief expedition as the ship was provisioned for fourteen months.

This news about the expedition was received by the American Museum of Natural History in a cablegram from Knud Rasmussen, the Danish explorer, who has helped in every way possible. In a supplementary letter he says that the information was received through the Danish vessel *Kap York* which had reached Holstenberg in southern Greenland on October 19 and there transferred her mail to the regular mail steamer, which brought them to Copenhagen. Later, on the arrival of the *Kap York* Herr Rasmussen hoped to receive further details.

Letters received by the same channel from Donald B. MacMillan, the leader of the Crocker Land Expedition, and W. Elmer Ekblaw, geologist and botanist, dated respectively April 6 and March 20, 1915, told of a trip for which Ekblaw had prepared, on which he proposed to study the geology and zoology of the western coast and the northern part of Ellesmere Island. The route as planned was as follows: from Etah across Smith Sound to the head of Beitstad Fiord (Flagler Bay), across the island to the head of Bay Fiord, north along the coast to Greely Fiord, with a possible side trip to the head of Canyon Fiord, up Greely Fiord and back across the island via Fletcher Lake and Lake Hazen to Fort Conger, on Hall Basin, and from here back to Etah via Kennedy Channel and Kane Basin. This itinerary covers a distance of 1,130 miles. Ekblaw left at the end of March and hoped to be back early in July at the latest.

OCEANS

New Magnetic Surveys by the "Carnegie." The magnetic survey vessel, the *Carnegie,* at present under the command of J. P. Ault of the Department of Terrestrial Magnetism of the Carnegie Institution, arrived at Port Lyttelton, New Zealand, on November 3, after a successful continuous trip of ninety days from Dutch Harbor, Alaska. Leaving Port Lyttelton on December 5, the *Carnegie* is now engaged on the accomplishment of the circumnavigation of the region between the parallels of 50° and 60° S., where almost no magnetic data have been secured during the past seventy-five years.

HUMAN GEOGRAPHY

Methods of Frost Fighting. Frost is most frequently associated with the phenomenon of inversion of temperature. It occurs on clear, dry nights when the air loses an abnormal amount of heat by radiation and when absence of horizontal movement in the atmosphere permits the accumulation of a stratum of cold, dry air near the surface of the ground. Frost, then, may be prevented by conservation of the heat of the earth, and the farmer's problem lies in determining the best method of accomplishing this result. The oldest method retains the heat by the application of some covering—straw, sheeting, the moistened dense smoke called smudge, etc. (Alexander McAdie: The Theory and Practice of Frost Fighting, *The Scientific Monthly,* December, 1915.) The principle is quite common in many forms of primitive industry. The Peruvian Indian has employed it, empirically of course, from time immemorial in his custom of burning the pastures of the sierra at the beginning of winter—June to September—the period of maximum cold and drought. The burning produces a layer of carbon, an excellent blanket for the conservation of heat. In marked contrast to this primitive method is the employment of artificial heat in the highly specialized fruit industry of California. Wood, straw, and coal have been used, gas and electricity are proposed, while at present crude oil is the chief source of heat. The high specific heat of water and water-vapor mark them out as valuable heat-retainers: flooding and the formation of light fog sheets may be advantageously used with certain crops, for instance the cranberry. Water likewise prevents the damage to plant tissue arising from too rapid thawing from a frozen state and elsewhere is useful in retarding development until the critical season is over. A possible fourth method, the mixing of the higher and warmer layers of the atmosphere with the lower and colder strata, still remains no more than an academic possibility.

GEOGRAPHICAL NEWS

Geography at the University of Chicago. In the Department of Geography of the University of Chicago there were 220 registrations during the autumn quarter, and nearly as many during the summer quarter. Since some students register for more than one course, the total number of students was somewhat less than the total number of registrations. During the academic year which closed last June, the total number of registrations in the department was 831, a larger number than in the Department of Zoology or of Botany. The Department of Geography has created wide interest in its work, and its influence is steadily increasing.

Presentation of a Geographical Library to the University of California. The French government has presented to the University of California the collection of some six thousand volumes representing France's contribution to civilization which formed a notable feature of the French exhibit at the Panama-Pacific International Exposition. The volumes on geography were selected by Emmanuel de Martonne; those on geology by Emmanuel de Margerie.

PERSONAL

PROFESSOR GEORGE H. BARTON, Director of the Teachers' School of Science, Boston, has been giving a course of lectures on "Mountains: Their Classification, Origin, Growth, Structure, and Decay" before the Appalachian Mountain Club of Boston. The subject of the fourth lecture, on November 17, was "Origin of Relict Mountains."

MR. H. O. BECKIT has, on the death of Professor Herbertson, been appointed acting director of the School of Geography at the University of Oxford. Mr. Beckit, it will be remembered, was a member of the Society's Transcontinental Excursion of 1912.

DR. FRANK M. CHAPMAN spoke on "The Origin of Zonal Faunas in the Andes" before the New York Academy of Sciences on December 13.

PROFESSOR W. M. DAVIS spoke on the "Glacial Sculpture of the Mission Range of Montana" at the public scientific sessions of the autumn meeting of the National Academy of Sciences on November 16 and 17. Other papers of geographical interest were "Recent Explorations in the Cactus Deserts of South America" by J. N. Rose (see also item on "Botanical Expedition to the Desert Regions of Brazil and Argentina" in this number on p. 144) and "Concomitant Changes in the Earth's Magnetism and Solar Radiation" by L. A. Bauer.

MAJOR-GENERAL WILLIAM C. GORGAS, Surgeon General of the United States Army, was presented with the gold medal of the Geographic Society of Chicago at its annual dinner on January 8. After the presentation Major-General Gorgas delivered an address entitled "Sanitation in Its Relation to Geography."

MR. FRANCIS HARPER, of the Brooklyn Institute Museum, gave an illustrated lecture on November 23 before the Linnaean Society of New York entitled "Observations on the Wood Buffalo in the Northwest."

PROFESSOR D. W. JOHNSON, of Columbia University, at the recent Columbus, Ohio, meeting of the American Association for the Advancement of Science, gave the annual evening address to which the general public is invited. His subject was "Surface Features of Europe as a Factor in the War."

MR. A. K. LOBECK, a graduate student in geology at Columbia University, spoke on "The Position of the New England Peneplain in the White Mountain Region" before the New York Academy of Sciences on December 6.

DR. ROBERT H. LOWIE and DR. PLINY E. GODDARD gave a course of four lectures on "The Varieties of Culture Among North American Indians" at the American Museum of Natural History during January. The subjects of the individual lectures were as follows: Statement of the Problems; The Indians of the East, January 6; The Indians of the Plains, January 13; The Indians of the Southwest, January 20; The Indians of the Pacific Coast; Résumé, January 27. The first two lectures were given by Doctor Lowie, the other two by Doctor Goddard.

DR. FRITZ MACHATSCHEK, assistant professor of geography at the University of Vienna, and, four years ago, a member of the Society's Transcontinental Excursion, has been appointed to the professorship of geography at the German University of Prague to succeed Professor Alfred Grund, who was killed in action early in the war.

PROFESSOR C. F. MARVIN, Chief of the U. S. Weather Bureau, spoke on "The Work of the Weather Bureau" at the Ohio Academy of Science meeting in November.

MR. A. G. OGILVIE, junior demonstrator in geography at the University of Oxford and a member of the Society's Transcontinental Excursion of 1912, volunteered for service at the front early in the war. At last report he was attached to the Mediterranean expeditionary force in a geographical capacity.

DR. WALTHER PENCK, son of Professor Albrecht Penck and recently instructor of geology at the University of Leipzig, has been appointed professor of geology, and Dr. Erich Obst, of the University of Marburg, professor of geography, at the recently reorganized University of Constantinople.

DR. JOSEPH E. POGUE, associate professor of geology and mineralogy at Northwestern University, gave an illustrated lecture on December 10 before the Geographic Society of Chicago entitled, ''Through the Heart of Colombia.''

OBITUARY

DR. ORVILLE A. DERBY died suddenly in Rio de Janeiro on November 27, aged 64. Since 1907 he had been director of the Geological Survey of Brazil. A pupil of Professor C. F. Hartt, of Cornell University, whose well-known ''Geology and Physical Geography of Brazil'' was published in 1870, he followed in his teacher's footsteps and went to Brazil. From 1875 to 1878 he was assistant geologist on the Geological Survey of Brazil and from 1886 to 1904 he was director of the Geographical and Geological Survey of the state of São Paulo. In 1906 he co-operated with Professor J. C. Branner of Leland Stanford University in producing a useful elementary manual of geology adapted to Brazilian students.

PROFESSOR EDWARD VAN DYKE ROBINSON died suddenly on December 10 in New York at the age of 48. Professor Robinson had just taken up his new duties at Columbia University, and his death is a great loss to the cause of geography in the United States. Professor Robinson's contributions to geography were mainly on the economic side. From 1907 to 1915 he had been professor of economics at the University of Minnesota. His textbook ''Commercial Geography,'' 1909, is widely used, and his recent ''Early Economic Conditions and the Development of Agriculture in Minnesota'' is a noteworthy contribution to the subject.

MR. WILLIAM J. SUTHERLAND, president of the Platteville (Wis.) Normal School, died suddenly on December 9. Mr. Sutherland is best known through his ''The Teaching of Geography,'' 1909. With C. M. Sanford he had recently written ''Practical Exercises in Geography: Book 1, Our Own Country and Her Possessions.'' For six years he had been head of the department of geography and geology in the Macomb (Ill.) Normal School. He was born in Cherry Valley, Ill., April 14, 1865.